

SEQUENCE LISTING

<110> Winslow, Barbara J.
Cochran, Mark D.

<120> Recombinant Virus Expressing Foreign DNA Encoding
Feline CD80, Feline CD86, Feline CD28, Feline CTLA-4 or
Feline Interferon-gama And Uses Thereof

<130> 54957-B

<140> Not Yet Known

<141> 1999-04-30

<150> 60/083,870

<151> 1998-05-01

<160> 82

<170> PatentIn Ver. 2.0

<210> 1

<211> 941

<212> DNA

<213> feline CD80

<220>

<221> CDS

<222> (1)..(876)

<400> 1

atg ggt cac gca gca aag tgg aaa aca cca cta ctg aag cac cca tat	48
Met Gly His Ala Ala Lys Trp Lys Thr Pro Leu Leu Lys His Pro Tyr	
1 5 10 15	

ccc aag ctc ttt ccg ctc ttg atg cta gct agt ctt ttt tac ttc tgt	96
Pro Lys Leu Phe Pro Leu Leu Met Leu Ala Ser Leu Phe Tyr Phe Cys	
20 25 30	

tca ggt atc atc cag gtg aac aag aca gtg gaa gaa gta gca gta cta	144
Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu	
35 40 45	

tcc tgt gat tac aac att tcc acc aaa gaa ctg acg gaa att cga atc	192
Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile	
50 55 60	

tat tgg caa aag gat gat gaa atg gtg ttg gct gtc atg tct ggc aaa	240
---	-----

Val Ile Thr Ala Leu Thr Leu Arg Cys Leu Val His Arg Pro Ala Ala
260 265 270

agg tgg aga caa aga gaa atg ggg aga gcg cgg aaa tgg aaa aga tct 864
Arg Trp Arg Gln Arg Glu Met Gly Arg Ala Arg Lys Trp Lys Arg Ser
275 280 285

cac ctg tct aca tagattctgc agaaccactg tatgcagagc atctggaggt 916
His Leu Ser Thr
290

agcctcttta gctcttctct actag 941

<210> 2
<211> 292
<212> PRT
<213> feline CD80

<400> 2
Met Gly His Ala Ala Lys Trp Lys Thr Pro Leu Leu Lys His Pro Tyr
1 5 10 15

Pro Lys Leu Phe Pro Leu Leu Met Leu Ala Ser Leu Phe Tyr Phe Cys
20 25 30

Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu
35 40 45

Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile
50 55 60

Tyr Trp Gln Lys Asp Asp Glu Met Val Leu Ala Val Met Ser Gly Lys
65 70 75 80

Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr
85 90 95

Asp Asn His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly
100 105 110

Lys Tyr Thr Cys Ile Ile Gln Lys Ile Glu Lys Gly Ser Tyr Lys Val
115 120 125

Lys His Leu Thr Ser Val Met Leu Leu Val Arg Ala Asp Phe Pro Val
130 135 140

Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His Asn Ile Lys Arg Ile

145		150		155		160
Met Cys Leu Thr Ser Gly Gly Phe Pro Lys Pro His Leu Ser Trp Leu						
	165		170		175	
Glu Asn Glu Glu Glu Leu Asn Ala Ile Asn Thr Thr Val Ser Gln Asp						
	180		185		190	
Pro Glu Thr Glu Leu Tyr Thr Ile Ser Ser Glu Leu Asp Phe Asn Met						
	195		200		205	
Thr Asn Asn His Ser Phe Leu Cys Leu Val Lys Tyr Gly Asn Leu Leu						
	210		215		220	
Val Ser Gln Ile Phe Asn Trp Gln Lys Ser Glu Pro Gln Pro Ser Asn						
	225		230		235	240
Asn Gln Leu Trp Ile Ile Ile Leu Ser Ser Val Val Ser Gly Ile Val						
		245		250		255
Val Ile Thr Ala Leu Thr Leu Arg Cys Leu Val His Arg Pro Ala Ala						
	260		265		270	
Arg Trp Arg Gln Arg Glu Met Gly Arg Ala Arg Lys Trp Lys Arg Ser						
	275		280		285	
His Leu Ser Thr						
	290					

<210> 3
 <211> 879
 <212> DNA
 <213> feline CD80

 <220>
 <221> CDS
 <222> (1)..(876)

<400> 3	
atg ggt cac gca gca aag tgg aaa aca cca cta ctg aag cac cca tat	48
Met Gly His Ala Ala Lys Trp Lys Thr Pro Leu Leu Lys His Pro Tyr	
1 5 10 15	
ccc aag ctc ttt ccg ctc ttg atg cta gct agt ctt ttt tac ttc tgt	96
Pro Lys Leu Phe Pro Leu Leu Met Leu Ala Ser Leu Phe Tyr Phe Cys	
20 25 30	

tca ggt atc atc cag gtg aac aag aca gtg gaa gaa gta gca gta cta	144
Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu	
35 40 45	
tcc tgt gat tac aac att tcc acc aaa gaa ctg acg gaa att cga atc	192
Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile	
50 55 60	
tat tgg caa aag gat gat gaa atg gtg ttg gct gtc atg tct ggc aaa	240
Tyr Trp Gln Lys Asp Asp Glu Met Val Leu Ala Val Met Ser Gly Lys	
65 70 75 80	
gta caa gtg tgg ccc aag tac aag aac cgc aca ttc act gac gtc acc	288
Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr	
85 90 95	
gat aac cac tcc att gtg atc atg gct ctg cgc ctg tca gac aat ggc	336
Asp Asn His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly	
100 105 110	
aaa tac act tgt atc att caa aag att caa aaa ggg tct tac aaa gtg	384
Lys Tyr Thr Cys Ile Ile Gln Lys Ile Gln Lys Gly Ser Tyr Lys Val	
115 120 125	
aaa cac ctg act tcg gtg atg tta ttg gtc aga gct gac ttc cct gtc	432
Lys His Leu Thr Ser Val Met Leu Leu Val Arg Ala Asp Phe Pro Val	
130 135 140	
cct agt ata act gat ctt gga aat cca tct cat aac atc aaa agg ata	480
Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His Asn Ile Lys Arg Ile	
145 150 155 160	
atg tgc tta act tct gga ggt ttt cca aag cct cac ctc tcc tgg ctg	528
Met Cys Leu Thr Ser Gly Gly Phe Pro Lys Pro His Leu Ser Trp Leu	
165 170 175	
gaa aat gaa gaa gaa tta aat gcc atc aac aca aca gtt tcc caa gat	576
Glu Asn Glu Glu Glu Leu Asn Ala Ile Asn Thr Thr Val Ser Gln Asp	
180 185 190	
cct gaa act gag ctc tac act att agc agt gaa ctg gat ttc aat atg	624
Pro Glu Thr Glu Leu Tyr Thr Ile Ser Ser Glu Leu Asp Phe Asn Met	
195 200 205	
aca aac aac cat agc ttc ctg tgt ctt gtc aag tat gga aac tta ata	672
Thr Asn Asn His Ser Phe Leu Cys Leu Val Lys Tyr Gly Asn Leu Ile	
210 215 220	

Lys Tyr Thr Cys Ile Ile Gln Lys Ile Gln Lys Gly Ser Tyr Lys Val
 115 120 125

Lys His Leu Thr Ser Val Met Leu Leu Val Arg Ala Asp Phe Pro Val
 130 135 140

Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His Asn Ile Lys Arg Ile
 145 150 155 160

Met Cys Leu Thr Ser Gly Gly Phe Pro Lys Pro His Leu Ser Trp Leu
 165 170 175

Glu Asn Glu Glu Glu Leu Asn Ala Ile Asn Thr Thr Val Ser Gln Asp
 180 185 190

Pro Glu Thr Glu Leu Tyr Thr Ile Ser Ser Glu Leu Asp Phe Asn Met
 195 200 205

Thr Asn Asn His Ser Phe Leu Cys Leu Val Lys Tyr Gly Asn Leu Ile
 210 215 220

Val Ser Gln Ile Phe Asn Trp Gln Lys Ser Glu Pro Gln Pro Ser Asn
 225 230 235 240

Asn Gln Leu Trp Ile Ile Ile Leu Ser Ser Val Val Ser Gly Ile Val
 245 250 255

Val Ile Thr Ala Leu Thr Leu Arg Cys Leu Val His Arg Pro Ala Ala
 260 265 270

Arg Trp Arg Gln Arg Glu Met Gly Arg Ala Arg Lys Trp Lys Arg Ser
 275 280 285

His Leu Ser Thr
 290

<210> 5
 <211> 1080
 <212> DNA
 <213> feline CD86

<220>
 <221> CDS
 <222> (63)..(1052)

<400> 5
 gtttctgtgt tcctcgggaa tgtcactgag cttatacatc tggctctctgg gagctgcagt 60

gg atg ggc att tgt gac agc act atg gga ctg agt cac act ctc ctt	107
Met Gly Ile Cys Asp Ser Thr Met Gly Leu Ser His Thr Leu Leu	
1 5 10 15	
gtg atg gcc ctc ctg ctc tct ggt gtt tct tcc atg aag agt caa gca	155
Val Met Ala Leu Leu Leu Ser Gly Val Ser Ser Met Lys Ser Gln Ala	
20 25 30	
tat ttc aac aag act gga gaa ctg cca tgc cat ttt aca aac tct caa	203
Tyr Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln	
35 40 45	
aac ata agc ctg gat gag ctg gta gta ttt tgg cag gac cag gat aag	251
Asn Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys	
50 55 60	
ctg gtt ctg tat gag ata ttc aga ggc aaa gag aac cct caa aat gtt	299
Leu Val Leu Tyr Glu Ile Phe Arg Gly Lys Glu Asn Pro Gln Asn Val	
65 70 75	
cat ctc aaa tat aag ggc cgt aca agc ttt gac aag gac aac tgg acc	347
His Leu Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr	
80 85 90 95	
ctg aga ctc cac aat gtt cag atc aag gac aag ggc aca tat cac tgt	395
Leu Arg Leu His Asn Val Gln Ile Lys Asp Lys Gly Thr Tyr His Cys	
100 105 110	
ttc att cat tat aaa ggg ccc aaa gga cta gtt ccc atg cac caa atg	443
Phe Ile His Tyr Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met	
115 120 125	
agt tct gac cta tca gtg ctt gct aac ttc agt caa cct gaa ata aca	491
Ser Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Thr	
130 135 140	
gta act tct aat aga aca gaa aat tct ggc atc ata aat ttg acc tgc	539
Val Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys	
145 150 155	
tca tct ata caa ggt tac cca gaa cct aag gag atg tat ttt cag cta	587
Ser Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu	
160 165 170 175	
aac act gag aat tca act act aag tat gat act gtc atg aag aaa tct	635
Asn Thr Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser	
180 185 190	

caa aat aat gtg aca gaa ctg tac aac gtt tct atc agc ttg cct ttt	683
Gln Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe	
195 200 205	
tca gtc cct gaa gca cac aat gtg agc gtc ttt tgt gcc ctg aaa ctg	731
Ser Val Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu	
210 215 220	
gag aca ctg gag atg ctg ctc tcc cta cct ttc aat ata gat gca caa	779
Glu Thr Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln	
225 230 235	
cct aag gat aaa gac cct gaa caa ggc cac ttc ctc tgg att gcg gct	827
Pro Lys Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala	
240 245 250 255	
gta ctt gta atg ttt gtt gtt ttt tgt ggg atg gtg tcc ttt aaa aca	875
Val Leu Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr	
260 265 270	
cta agg aaa agg aag aag aag cag cct ggc ccc tct cat gaa tgt gaa	923
Leu Arg Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu	
275 280 285	
acc atc aaa agg gag aga aaa gag agc aaa cag acc aac gaa aga gta	971
Thr Ile Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val	
290 295 300	
cca tac cac gta cct gag aga tct gat gaa gcc cag tgt gtt aac att	1019
Pro Tyr His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile	
305 310 315	
ttg aag aca gcc tca ggg gac aaa aat cag tag gaaaatggtg gcttggcgtg	1072
Leu Lys Thr Ala Ser Gly Asp Lys Asn Gln	
320 325 330	
ctgacaat	1080

<210> 6

<211> 329

<212> PRT

<213> feline CD86

<400> 6

Met Gly Ile Cys Asp Ser Thr Met Gly Leu Ser His Thr Leu Leu Val
1 5 10 15

Met Ala Leu Leu Leu Ser Gly Val Ser Ser Met Lys Ser Gln Ala Tyr
 20 25 30

Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln Asn
 35 40 45

Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys Leu
 50 55 60

Val Leu Tyr Glu Ile Phe Arg Gly Lys Glu Asn Pro Gln Asn Val His
 65 70 75 80

Leu Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr Leu
 85 90 95

Arg Leu His Asn Val Gln Ile Lys Asp Lys Gly Thr Tyr His Cys Phe
 100 105 110

Ile His Tyr Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Ser
 115 120 125

Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Thr Val
 130 135 140

Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser
 145 150 155 160

Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn
 165 170 175

Thr Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln
 180 185 190

Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser
 195 200 205

Val Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu
 210 215 220

Thr Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro
 225 230 235 240

Lys Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val
 245 250 255

Leu Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu
 260 265 270

Arg Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr
 275 280 285

Ile Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro
 290 295 300

Tyr His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile Leu
 305 310 315 320

Lys Thr Ala Ser Gly Asp Lys Asn Gln
 325

<210> 7

<211> 688

<212> DNA

<213> feline CD28

<220>

<221> CDS

<222> (1)..(663)

<400> 7

atg atc ctc agg ctg ctt ctg gct ctc aac ttc ttc ccc tca att caa 48
 Met Ile Leu Arg Leu Leu Leu Ala Leu Asn Phe Phe Pro Ser Ile Gln
 1 5 10 15

gta aca gaa aac aag att ttg gtg aag cag ttg ccc agg ctt gtg gtg 96
 Val Thr Glu Asn Lys Ile Leu Val Lys Gln Leu Pro Arg Leu Val Val
 20 25 30

tac aac aat gag gtc aac ctt agc tgc aag tac act cac aac ttc ttc 144
 Tyr Asn Asn Glu Val Asn Leu Ser Cys Lys Tyr Thr His Asn Phe Phe
 35 40 45

tca aag gag ttc cgg gca tcc ctt tat aag gga gta gat agt gct gtg 192
 Ser Lys Glu Phe Arg Ala Ser Leu Tyr Lys Gly Val Asp Ser Ala Val
 50 55 60

gaa gtc tgc gtt gtg aat gga aat tac tcc cat cag cct cag ttc tac 240
 Glu Val Cys Val Val Asn Gly Asn Tyr Ser His Gln Pro Gln Phe Tyr
 65 70 75 80

tca agt aca gga ttc gac tgt gat ggg aaa ttg ggc aat gaa aca gtg 288
 Ser Ser Thr Gly Phe Asp Cys Asp Gly Lys Leu Gly Asn Glu Thr Val
 85 90 95

aca ttc tac ctc cga aat ttg ttt gtt aac caa acg gat att tac ttc	336
Thr Phe Tyr Leu Arg Asn Leu Phe Val Asn Gln Thr Asp Ile Tyr Phe	
100 105 110	
tgc aaa att gaa gtc atg tat cca cct cct tac ata gac aat gag aag	384
Cys Lys Ile Glu Val Met Tyr Pro Pro Pro Tyr Ile Asp Asn Glu Lys	
115 120 125	
agc aat ggg acc att atc cac gtg aaa gag aaa cat ctt tgt cca gct	432
Ser Asn Gly Thr Ile Ile His Val Lys Glu Lys His Leu Cys Pro Ala	
130 135 140	
cag ctg tct cct gaa tct tcc aag cca ttt tgg gca ctg gtg gtg gtt	480
Gln Leu Ser Pro Glu Ser Ser Lys Pro Phe Trp Ala Leu Val Val Val	
145 150 155 160	
ggt gga atc cta ggt ttc tac agc ttg cta gca aca gtg gct ctt ggt	528
Gly Gly Ile Leu Gly Phe Tyr Ser Leu Leu Ala Thr Val Ala Leu Gly	
165 170 175	
gct tgc tgg atg aag acc aag agg agt agg atc ctt cag agt gac tat	576
Ala Cys Trp Met Lys Thr Lys Arg Ser Arg Ile Leu Gln Ser Asp Tyr	
180 185 190	
atg aac atg acc ccc cgg agg cca ggg ccc acc cga agg cac tac caa	624
Met Asn Met Thr Pro Arg Arg Pro Gly Pro Thr Arg Arg His Tyr Gln	
195 200 205	
cct tac gcc cca gca cgc gac ttt gcg gca tac cgt tcc tgacatggac	673
Pro Tyr Ala Pro Ala Arg Asp Phe Ala Ala Tyr Arg Ser	
210 215 220	
ccctatccag aagcc	688

<210> 8
 <211> 221
 <212> PRT
 <213> feline CD28

<400> 8
 Met Ile Leu Arg Leu Leu Leu Ala Leu Asn Phe Phe Pro Ser Ile Gln
 1 5 10 15
 Val Thr Glu Asn Lys Ile Leu Val Lys Gln Leu Pro Arg Leu Val Val
 20 25 30
 Tyr Asn Asn Glu Val Asn Leu Ser Cys Lys Tyr Thr His Asn Phe Phe

35	40	45
Ser Lys Glu Phe Arg Ala Ser Leu Tyr Lys Gly Val Asp Ser Ala Val		
50	55	60
Glu Val Cys Val Val Asn Gly Asn Tyr Ser His Gln Pro Gln Phe Tyr		
65	70	75 80
Ser Ser Thr Gly Phe Asp Cys Asp Gly Lys Leu Gly Asn Glu Thr Val		
85	90	95
Thr Phe Tyr Leu Arg Asn Leu Phe Val Asn Gln Thr Asp Ile Tyr Phe		
100	105	110
Cys Lys Ile Glu Val Met Tyr Pro Pro Pro Tyr Ile Asp Asn Glu Lys		
115	120	125
Ser Asn Gly Thr Ile Ile His Val Lys Glu Lys His Leu Cys Pro Ala		
130	135	140
Gln Leu Ser Pro Glu Ser Ser Lys Pro Phe Trp Ala Leu Val Val Val		
145	150	155 160
Gly Gly Ile Leu Gly Phe Tyr Ser Leu Leu Ala Thr Val Ala Leu Gly		
165	170	175
Ala Cys Trp Met Lys Thr Lys Arg Ser Arg Ile Leu Gln Ser Asp Tyr		
180	185	190
Met Asn Met Thr Pro Arg Arg Pro Gly Pro Thr Arg Arg His Tyr Gln		
195	200	205
Pro Tyr Ala Pro Ala Arg Asp Phe Ala Ala Tyr Arg Ser		
210	215	220

<210> 9
 <211> 749
 <212> DNA
 <213> feline CTLA-4

<220>
 <221> CDS
 <222> (27)..(698)

<400> 9
 aacctgaaca ctgctcccat aaagcc atg gct tgc ttt gga ttc cgg agg cat 53
 Met Ala Cys Phe Gly Phe Arg Arg His

```

ggg gct cag ctg gac ctg gct tct agg acc tgg ccc tgc act gct ctg 101
Gly Ala Gln Leu Asp Leu Ala Ser Arg Thr Trp Pro Cys Thr Ala Leu
10 15 20 25

ttt tct ctt ctc ttt atc ccc gtc ttc tcc aaa ggg atg cat gtg gcc 149
Phe Ser Leu Leu Phe Ile Pro Val Phe Ser Lys Gly Met His Val Ala
30 35 40

cac cct gca gtg gtg ctg gcc agc agc cga ggt gtc gcc agc ttc gtg 197
His Pro Ala Val Val Leu Ala Ser Ser Arg Gly Val Ala Ser Phe Val
45 50 55

tgt gaa tat ggg tct tca ggc aat gcc gcc aaa ttc cga gtg act gtg 245
Cys Glu Tyr Gly Ser Ser Gly Asn Ala Ala Lys Phe Arg Val Thr Val
60 65 70

ctg agg caa act ggc agc caa atg act gaa gtc tgt gct gcg aca tac 293
Leu Arg Gln Thr Gly Ser Gln Met Thr Glu Val Cys Ala Ala Thr Tyr
75 80 85

aca gtg gag aat gag ttg gcc ttc cta aat gat tcc acc tgc act ggc 341
Thr Val Glu Asn Glu Leu Ala Phe Leu Asn Asp Ser Thr Cys Thr Gly
90 95 100 105

atc tcc agc gga aac aaa gtg aac ctc acc atc caa ggg ttg agg gcc 389
Ile Ser Ser Gly Asn Lys Val Asn Leu Thr Ile Gln Gly Leu Arg Ala
110 115 120

atg gac acg gga ctc tac atc tgc aag gtg gag ctc atg tac cca cca 437
Met Asp Thr Gly Leu Tyr Ile Cys Lys Val Glu Leu Met Tyr Pro Pro
125 130 135

ccc tac tat gca ggc atg ggc aat gga acc cag att tat gtc atc gat 485
Pro Tyr Tyr Ala Gly Met Gly Asn Gly Thr Gln Ile Tyr Val Ile Asp
140 145 150

cct gaa cct tgc cca gat tct gac ttc ctc ctc tgg atc ctc gca gca 533
Pro Glu Pro Cys Pro Asp Ser Asp Phe Leu Leu Trp Ile Leu Ala Ala
155 160 165

gtc agt tca gga ttg ttt ttt tat agc ttc ctt atc aca gct gtt tct 581
Val Ser Ser Gly Leu Phe Phe Tyr Ser Phe Leu Ile Thr Ala Val Ser
170 175 180 185

ttg agc aaa atg cta aag aaa aga agc cct ctt act aca ggg gtc tat 629
Leu Ser Lys Met Leu Lys Lys Arg Ser Pro Leu Thr Thr Gly Val Tyr

```

190

195

200

gtg aaa atg ccc cca aca gag cca gaa tgt gaa aag caa ttt cag cct 677
 Val Lys Met Pro Pro Thr Glu Pro Glu Cys Glu Lys Gln Phe Gln Pro
 205 210 215

tat ttt att ccc atc aat tga cacaccgtta tgaagaagga agaacactgt 728
 Tyr Phe Ile Pro Ile Asn
 220

ccaatttcta agagctgagg c 749

<210> 10

<211> 223

<212> PRT

<213> feline CTLA-4

<400> 10

Met Ala Cys Phe Gly Phe Arg Arg His Gly Ala Gln Leu Asp Leu Ala
 1 5 10 15

Ser Arg Thr Trp Pro Cys Thr Ala Leu Phe Ser Leu Leu Phe Ile Pro
 20 25 30

Val Phe Ser Lys Gly Met His Val Ala His Pro Ala Val Val Leu Ala
 35 40 45

Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser Ser Gly
 50 55 60

Asn Ala Ala Lys Phe Arg Val Thr Val Leu Arg Gln Thr Gly Ser Gln
 65 70 75 80

Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asn Glu Leu Ala
 85 90 95

Phe Leu Asn Asp Ser Thr Cys Thr Gly Ile Ser Ser Gly Asn Lys Val
 100 105 110

Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu Tyr Ile
 115 120 125

Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Ala Gly Met Gly
 130 135 140

Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro Asp Ser
 145 150 155 160

Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu Phe Phe
165 170 175

Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu Lys Lys
180 185 190

Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro Thr Glu
195 200 205

Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile Asn
210 215 220

<210> 11
<211> 40
<212> DNA
<213> feline CD80 primer

<400> 11
cgcggtatccg caccatgggt cacgcagcaa agtggaatac 40

<210> 12
<211> 25
<212> DNA
<213> feline CD80 primer

<400> 12
cctagtagag aagagctaaa gaggc 25

<210> 13
<211> 33
<212> DNA
<213> feline CD28 primer

<400> 13
cgcggtatcca ccggtagcac aatgacctc agg 33

<210> 14
<211> 31
<212> DNA
<213> feline CD28 primer

<400> 14
cgcggtatcct ctggatagg gtccatgtca g 31

<210> 15
<211> 27
<212> DNA
<213> feline CTLA-4 primer

<400> 15
atggcttcgc cttggatttc cagcagg

27

<210> 16
<211> 29
<212> DNA
<213> feline CTLA-4 primer

<400> 16
tcaattgaat gaggaataaa ataaggctg

29

<210> 17
<211> 28
<212> DNA
<213> feline CTLA-4 primer

<400> 17
tgttgggttt ctgactctga cttccctg

28

<210> 18
<211> 24
<212> DNA
<213> feline CTLA-4 primer

<400> 18
gcatagtagg gtggtgggta catg

24

<210> 19
<211> 28
<212> DNA
<213> feline CTLA-4 primer

<400> 19
tgttgggttt ctgactctga cttccctg

28

<210> 20

<211> 20
 <212> DNA
 <213> feline CTLA-4 primer

 <400> 20
 acatgagctc caccttgagc 20

 <210> 21
 <211> 27
 <212> DNA
 <213> feline CTLA-4 primer

 <400> 21
 ccacccaat acgactcact atagggc 27

 <210> 22
 <211> 24
 <212> DNA
 <213> feline CTLA-4 primer

 <400> 22
 gtgaatatgg gtcttcaggc aatg 24

 <210> 23
 <211> 23
 <212> DNA
 <213> feline CTLA-4 primer

 <400> 23
 actcactata gggctcgagc ggc 23

 <210> 24
 <211> 23
 <212> DNA
 <213> feline CTLA-4 primer

 <400> 24
 gaaatccgag tgactgtgct gag 23

 <210> 25
 <211> 24
 <212> DNA
 <213> feline CTLA-4 primer

<400> 25
aacctgaaca ctgctcccat aaag 24

<210> 26
<211> 25
<212> DNA
<213> feline CTLA-4 primer

<400> 26
gcctcagctc ttagaaattg gacag 25

<210> 27
<211> 21
<212> DNA
<213> feline CD86 primer

<400> 27
tagtattttg gcaggaccag g 21

<210> 28
<211> 23
<212> DNA
<213> feline CD86 primer

<400> 28
ctgtgacatt atcttgagat ttc 23

<210> 29
<211> 23
<212> DNA
<213> feline CD86 primer

<400> 29
gagcatgcac taatgggact gag 23

<210> 30
<211> 23
<212> DNA
<213> feline CD86 primer

<400> 30
ctgtgacatt atcttgagat ttc 23

<210> 31
<211> 27
<212> DNA
<213> feline CD86 primer

<400> 31
ccatcctaatacgcactcactatagggc

27

<210> 32
<211> 28
<212> DNA
<213> feline CD86 primer

<400> 32
tgggtaaccttgtatagatgagcaggctc

28

<210> 33
<211> 23
<212> DNA
<213> feline CD86 primer

<400> 33
actcactatagggctcgagcggc

23

<210> 34
<211> 25
<212> DNA
<213> feline CD86 primer

<400> 34
caggttgactgaagttagcagcac

25

<210> 35
<211> 27
<212> DNA
<213> feline CD86 primer

<400> 35
ccatcctaatacgcactcactatagggc

27

<210> 36

<211> 25
<212> DNA
<213> feline CD86 primer

<400> 36
ggacaagggc acatatcact gtttc

25

<210> 37
<211> 23
<212> DNA
<213> feline CD86 primer

<400> 37
actcactata gggctcgagc ggc

23

<210> 38
<211> 25
<212> DNA
<213> feline CD86 primer

<400> 38
cagtgccttgc taacttcagt caacc

25

<210> 39
<211> 23
<212> DNA
<213> feline CD86 primer

<400> 39
cggaatgtc actgagctta tag

23

<210> 40
<211> 23
<212> DNA
<213> feline CD86 primer

<400> 40
gatctttttc aggttagcag ggg

23

<210> 41
<211> 20
<212> DNA
<213> feline CD80 primer

U.S. DEPARTMENT OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY
WASHINGTON, D.C. 20503-4801

<400> 41
atgggtcacg cagcaaagtg 20

<210> 42
<211> 20
<212> DNA
<213> feline CD80 primer

<400> 42
ctatgtagac aggtgagatc 20

<210> 43
<211> 17
<212> DNA
<213> feline CD80 primer

<400> 43
caggaaacag ctatgac 17

<210> 44
<211> 18
<212> DNA
<213> feline CD80 primer

<400> 44
aatacgactc actatagg 18

<210> 45
<211> 21
<212> DNA
<213> feline CD80 primer

<400> 45
aacaccattt catcatcctt t 21

<210> 46
<211> 23
<212> DNA
<213> feline CD80 primer

<400> 46
atacaagtgt atttgccatt gtc 23

<210> 47
<211> 20
<212> DNA
<213> feline CD80 primer

<400> 47
agctctgacc aataacatca 20

<210> 48
<211> 22
<212> DNA
<213> feline CD80 primer

<400> 48
attagaaatc cagttcactg ct 22

<210> 49
<211> 21
<212> DNA
<213> feline CD80 primer

<400> 49
tcatgtctgg caaagtacaa g 21

<210> 50
<211> 18
<212> DNA
<213> feline CD80 primer

<400> 50
attcactgac gtcaccga 18

<210> 51
<211> 16
<212> DNA
<213> feline CD80 primer

<400> 51
aaggctgtgg ctctga 16

<210> 52

<211> 29
<212> DNA
<213> feline CD80 primer

<400> 52
tcgagaattc gggtcacgca gcaaagtgg 29

<210> 53
<211> 32
<212> DNA
<213> feline CD80 primer

<400> 53
gctagatcc aatctatgta gacaggtgag at 32

<210> 54
<211> 32
<212> DNA
<213> feline CD80 primer

<400> 54
gatgaattcc atgatactca ggctgggctt ct 32

<210> 55
<211> 29
<212> DNA
<213> feline CD80 primer

<400> 55
gatcagatct caggaacggt atgccgcaa 29

<210> 56
<211> 22
<212> DNA
<213> B7-2 primer

<400> 56
ggcccagta kaagaaccgg ac 22

<210> 57
<211> 24
<212> DNA
<213> B7-3 primer

<400> 57
cagwttcagg atcytgggaa aytg

24

<210> 58
<211> 20
<212> DNA
<213> B7-284 primer

<400> 58
ttatactagg gacaggggaag

20

<210> 59
<211> 20
<212> DNA
<213> B7-190 primer

<400> 59
aggctttgga aaacctccag

20

<210> 60
<211> 21
<212> DNA
<213> B7-20 primer

<400> 60
ttgttatcgg tgacgtcagt g

21

<210> 61
<211> 22
<212> DNA
<213> B7-135 primer

<400> 61
caataacatc accgaagtca gg

22

<210> 62
<211> 22
<212> DNA
<213> B7-s220 primer

<400> 62
gtcatgtctg gcaaagtaca ag

22

<210> 63
<211> 22
<212> DNA
<213> B7-50 primer

<400> 63
cactgacgtc accgataacc ac 22

<210> 64
<211> 22
<212> DNA
<213> B7-140 primer

<400> 64
ctgacttcgg tgatgttatt gg 22

<210> 65
<211> 21
<212> DNA
<213> B7-550 primer

<400> 65
gccatcaaca caacagtttc c 21

<210> 66
<211> 22
<212> DNA
<213> B7-620 primer

<400> 66
tatgacaaac aaccatagct tc 22

<210> 67
<211> 20
<212> DNA
<213> B7-1281 primer

<400> 67
graagawtgc ctcatgakcc 20

<210> 68

<211> 17
<212> DNA
<213> B7-1260 primer

<400> 68
cayratccaa cataggg

17

<210> 69
<211> 21
<212> DNA
<213> B7 start primer

<400> 69
atgggtcacg cagcaaagtg g

21

<210> 70
<211> 25
<212> DNA
<213> B7-960 primer

<400> 70
cctagtagag aagagctaaa gaggc

25

<210> 71
<211> 21
<212> DNA
<213> CD28-113 primer

<400> 71
caaccttagc tgcaagtaca c

21

<210> 72
<211> 20
<212> DNA
<213> CD28-768 primer

<400> 72
ggcttctgga tagggatagg

20

<210> 73
<211> 22
<212> DNA
<213> CD28-190 primer

<400> 73
cggaggtaga attgcactgt cc 22

<210> 74
<211> 21
<212> DNA
<213> CD28-239 primer

<400> 74
atattgcaga agtaaataatc c 21

<210> 75
<211> 33
<212> DNA
<213> feCD28 primer

<400> 75
cgcggtacca ccggtagcac aatgatcctc agg 33

<210> 76
<211> 31
<212> DNA
<213> feCD28 primer

<400> 76
cgcggtacct ctggatagcc ctccatgtca g 31

<210> 77
<211> 31
<212> DNA
<213> FIV PPR upstream primer

<400> 77
gcccggatcc tatggcagaa gggtttgag c 31

<210> 78
<211> 31
<212> DNA
<213> FIV PPR downstream primer

<400> 78
ccgtggatcc ggcactccat cattcctcct c 31

<210> 79
<211> 32
<212> DNA
<213> FIV PPR upstream primer

<400> 79
gcgtgaattc ggggaatgga caggggcgag at 32

<210> 80
<211> 28
<212> DNA
<213> FIV PPR downstream primer

<400> 80
gagccagatc tgctcttttt actttccc 28

<210> 81
<211> 36
<212> DNA
<213> IFN primer

<400> 81
tcgagaattc gatgaattac acaagtttta ttttcg 36

<210> 82
<211> 33
<212> DNA
<213> IFN primer

<400> 82
tcgaggatcc ttatttcgat gctctacggc etc 33